

Fission Battery Workshop 2021

Wednesday, February 24, 2021

11:00 a.m. – 3:00 p.m. (Eastern Time)

Fission Battery Initiative

Technology Innovations for Fission Batteries: Advanced Manufacturing

Moderator: Vivek Agarwal, Ph.D.

The initiative envisions *developing technologies that enable nuclear reactor systems to function as batteries and to be referred as fission batteries.*

Additive manufacturing is one of the required technologies to achieve the initiative vision and to ensure expanded deployment of fission batteries to meet clean energy demands across broader applications and markets.

The aim of this *Workshop* is to:

- Understand technological challenges, knowledge gaps, and limitations (development, demonstration, and deployment) associated with additive manufacturing and advanced materials for fission batteries.
- Role of Multiphysics and multi-scale modeling and simulation, machine learning and artificial intelligence, and digital twins would play in addressing technological challenges and knowledge gaps.

The expected outcome of this workshop is to identify technological goals that additive manufacturing approaches must achieve to standardize attribute of the fission battery initiative. Concurrently, the workshop will enable broad discussion on the potential of the new technologies and facilitate the creation of research path and networks.

INL & Guest Presenters

Vivek Agarwal, Ph.D.
Senior Research Scientist,
Instrumentation, Controls, and Data Science
Idaho National Laboratory

Michael McMurtrey, Ph.D.
Materials Scientist
Idaho National Laboratory

Edward D. Herderick, Ph.D.
Director Additive Manufacturing
College of Engineering CDME
The Ohio State University

Derick Botha
Innovation Manager
NuScale Power

Slade Gardner, Ph.D.
President and Founder
Big Metal Additive, LLC

Isabella J. van Rooyen, Ph.D., MBA
National Technical Director: DOE – NE
Advanced Methods for Manufacturing
INL Distinguished Staff Scientist
Reactor Systems Design and Analysis Division
Idaho National Laboratory

Samuel Briggs, Ph.D.
Assistant Professor
School of Nuclear Science & Engineering
Oregon State University

11:00-11:15	Fission Battery Initiative and Workshop Overview	Vivek Agarwal Senior Research Scientist Instrumentation, Controls, and Data Science (ICDS) Department Idaho National Laboratory
11:15-11:40	Qualification Challenges for Additively Manufactured High Temperature Nuclear Components.....	Michael McMurtrey Idaho National Laboratory
11:40-12:05	Industrialization of Metal AM: Progress and Future Vision	Ed Herderick The Ohio State University
12:05-12:30	Advanced Materials for Microreactors.....	Derick Botha NuScale Power
12:30-12:45	Break	
12:45 – 1:10	Design for “ _____ ”	Slade Gardner Big Metal Additive
1:10 – 1:35	A Paradigm Shift in Manufacturing as Opportunity for Fission Battery Success	Isabella J. van Rooyen Idaho National Laboratory
1:35 – 2:00	Perspectives on Materials Degradation Challenges for Fission Battery Deployment	Samuel Briggs Oregon State University
2:00 – 3:00	Panel Session